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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,358	05/18/2006	**Geoffrey William Miller**	P08836US00/BAS	9201

881 7590 06/06/2008

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EXAMINER	
SHEVIN, MARK L	
ART UNIT	**PAPER NUMBER**
1793	

MAIL DATE	DELIVERY MODE
06/06/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,358	MILLER ET AL.	
	Examiner	Art Unit	
	Mark L. Shevin	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/12/2008 and 01/12/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status

1. Claims 1-17 and 19-20, filed as a preliminary amendment on January 12th, 2006, are pending.

Priority

2. Applicant's claim to benefit of Australian patent application 2003903632, filed July 14th, 2003.

Information Disclosure Statements

3. The information disclosure statements (IDS) submitted January 12th, 2006 and May 12th, 2008 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements have been considered by the examiner. Please refer to applicants' copies of the 1449 forms submitted herewith.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. **Claims 1-6, 17, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Agatzini** (GR 1001555) in view of **Queneau** (US 4,044,096), **Patzelt** (US 5,642,863) and **Parker** (US 4,173,519).

Agatzini:

Agatzini, drawn to a hydrometallurgical method for the extraction of nickel and cobalt from low to very low-grade nickel and cobalt oxide ores (Abstract), teaches that traditional nickel and cobalt extraction methods are not economically feasible for recovering nickel oxide ores with a nickel content of less than 1 wt% (p. 1, lines 25-30) and thus more prevalent, low-grade ores must be processed in an inexpensive manner instead (p. 2, lines 5-10).

Agatzini teaches that low-grade nickel oxide ores should be subjected to heap leaching using a dilute sulphuric acid as the leaching agent (p. 2, lines 15-20). The problem is that fine materials (clays) impede percolation by swelling, which both absorbs the lixiviant sulphuric acid solution and closes off pores where the solution need trickle (p. 2, lines 22-30).

The other problem identified by Agatzini was the that of the particle size used for heap leaching, which Agatzini taught can be as large as 3 cm while maintaining 'very good' extraction efficiency without incurring costs due to grinding ore prior to leaching (p. 3, lines 1-5).

Agatzini does not specifically teach beneficiating the ore to separate it into an upgraded ore fraction and a coarse, siliceous low-grade rejects fraction which is

substantially free from fines and clay materials or separately processing the upgraded ore fraction for the recovery of nickel and cobalt.

Queneau:

Queneau, drawn to increasing the leaching efficiency of nickeliferous lateritic ore (Abstract), teaches that leaching efficiency can be optimized by scalping the ore to remove the coarse, low-nickel fraction of less than about 0.7 wt% Ni (col. 2, line 62) and subjecting the upgraded fines to high pressure acid leaching (HPAL, col. 2, line 40 - col. 3, line 15 and Abstract).

Queneau teaches by example that ore size classification is important in optimizing nickel and cobalt extraction (col. 4, lines 10-23).

Patzelt:

Patzelt, drawn to a method for extracting metals with a higher yield (col. 1, lines 35-40), teaches that heap leaching and tank leaching have their own advantages but are limited to specific grain size distributions (col. 1, lines 48-51). Accordingly, ore is divided into oversize (coarse) and fine material in a classification stage where the oversize material is heap leached and the fine material is tank leached (col. 1, lines 51-58).

The oversize material is left with pore-like interstices that results in extremely uniform permeability to the lixiviant and atmospheric oxygen, which together favor the desired optimal extraction yield of the metals contained in the ore particles al(col. 1, line 62 to col. 2, line 8). The higher permeability of the oversize material results in cheaper

heap leaching due to shorter ore transport distances and lower costs for lining the stockpile floor (col. 2, lines 57-66).

Both ore streams may be washed before classification or just the oversize materials may be washed after classification, to wash fine material from the ore (col. 8, lines 28-47).

Parker:

Parker, drawn to a method for facilitating the economical recovery of metal values from low grade ores (col. 1, lines 5-11), teaches, like Agatzini, that slime (aka fines or clays) prevent the advantageous recovery of pregnant solutions due to inhibition of percolation (col. 1, line 52 - col. 2, line 15). The ore is de-slimed by classification (col. 3, lines 1-5).

Regarding claim 1, it would have been obvious to one of ordinary skill in nickel hydrometallurgy, at the time the invention was made, taking the discloses of Agatzini, Queneau, Patzelt, and Parker as a whole, to modify the low-grade nickel heap leaching process of Agatzini to include separating the ore into a upgraded fraction and low-grade rejects fraction, separating the fines from the coarse low-grade fraction, and processing the upgraded fraction to recovery nickel and cobalt for the following reasons. Queneau taught that leaching efficiency for nickel laterite ore is optimized when the coarse low-grade fraction is separated out and the finer, upgraded section is subjected to a high pressure acid leach (col. 2, line 40 - col. 3, line 15 and Abstract). This is echoed by Patzelt which taught that oversize material is heap leached and finer high metal value fraction tank leached allows greater overall metal recovery.

Motivation to remove the fines from the coarse material comes from Patzelt in teaching the oversize (coarse) material is advantageous heap leached as the interstices and pores are free from finer particles that would obstruct these forms of porosity (col. 1, lines 60-67) and Parker which taught the important of de-sliming by classification (col. 3, lines 1-5).

Regarding claim 2, Patzelt and Parker suggest the removal of fines and clay materials as these hinder leaching by slowing percolation of lixiviant (Patzelt, col. 1, lines 60-67 and Parker (col. 1, line 52 - col. 2, line 15).

Regarding claim 3, Queneau teaches subjecting an upgraded ore fraction to high pressure acid leaching (col. 2, line 40 - col. 3, line 15 and Abstract).

Regarding claims 4 and 6, Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64) which would be expected by one of ordinary skill to recovery nickel and cobalt using 'known metallurgical processing routes'.

Regarding claims 5 and 19, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would expect the pregnant solution to be passed on for further processing independently from upgraded ore fractions due to the upgraded ore fraction containing being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by

Queneau (col. 3, lines 25-50). Furthermore, one would expect the nickel and cobalt values to be recovered using known, and thus proven, metallurgical processing routes.

Regarding claim 17, Agatzini taught that existing hydrometallurgical techniques cannot treat nickel oxide ores with nickel contents below 1% wt and thus one of ordinary skill would expect such 'low-grade' nickel ores to be used in heap leaching to have nickel contents below 1 wt%. MPEP 2144.05, para I states: "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists."

5. **Claims 7-16 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Agatzini** in view of **Queneau**, **Patzelt** and **Parker** as applied to claims 1-6, 17, and 19 above, in further view of **Arroyo** (US 2002/0041840).

The disclosures of Agatzini, Queneau, Patzelt, and Parker were discussed above, however none of these references specifically teach separating laterite ore into limonite and saprolite fractions.

Arroyo

Arroyo, drawn to a hydrometallurgical process for leaching nickel and cobalt from both nickeliferous laterites, namely limonite and saprolite ores, at atmospheric pressure (para 0021).

Limonite and saprolite are separated and leached separately (para 0022-0024). It is suggested that the limonite and saprolite as separated so as to treat the different iron content contained therein (para 0017 and 0024-0025).

Regarding claim 7, it would have been obvious to one of ordinary skill in nickel hydrometallurgy, at the time the invention was made, taking the disclosures of Agatzini, Queneau, Patzelt, Parker, and Arroyo as a whole, to separately leach limonite and saprolite as taught by Arroyo in the heap leaching process as previous established using Agatzini in view of Queneau, Patzelt, and Parker as Arroyo had suggested that separating nickel laterite ore into high iron limonite and low iron saprolite allows for better control of iron precipitation kinetics.

Motivation to remove the fines from the coarse material comes from Patzelt in teaching the oversize (coarse) material is advantageous heap leached as the interstices and pores are free from finer particles that would obstruct these forms of porosity (col. 1, lines 60-67) and Parker which taught the important of de-sliming by classification (col. 3, lines 1-5).

Regarding claim 8, Queneau teaches subjecting an upgraded ore fraction to high pressure acid leaching (col. 2, line 40 - col. 3, line 15 and Abstract).

Regarding claim 9, Figures 1 and 2 from Arroyo disclose blending the limonite and saprolite leaching solutions together and subjecting them to further processing for metals recovery. Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64) which would be expected by one of ordinary skill to recovery nickel and cobalt using 'known metallurgical processing routes'.

Regarding claims 10 and 11, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would

expect the pregnant solution to be passed on for further processing and independently from upgraded ore fractions due to the upgraded ore fraction being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by Queneau (col. 3, lines 25-50). . Furthermore, one would expect the nickel and cobalt values to be recovered using known, and thus proven, metallurgical processing routes such as solvent extraction or ion exchange as taught by Arroyo (para 0029).

Regarding claim 12, Arroyo teaches that the acid content pregnant solution from limonite leaching is neutralized and iron precipitated as jarosite by contacting the solution with saprolite ore (paras 0024 and 0025).

Regarding claim 13, Figures 1 and 2 from Arroyo disclose blending the limonite and saprolite leaching solutions together and subjecting them to further processing for metals recovery. Parker teaches that the pregnant solutions from the heap leaching and fine soak leaching legs can be combined and sent to the same downstream metal recovery process (col. 1, lines 58-64).

Regarding claim 14, Agatzini taught the heap leaching of low-grade rejects and as nickel and cobalt recovery is the stated goal of his patent, one would expect the pregnant solution to be passed on for further processing and independently from upgraded ore fractions due to the upgraded ore fraction being leached in a more aggressive manner such as through HPAL and has a higher nickel to impurity ratio, resulting in a better pregnant solution for further metals recovery as taught by Queneau (col. 3, lines 25-50).

Regarding claim 15, Arroyo teaches that the final leachate should be treated for nickel and cobalt recovery by known metallurgical techniques such as solvent extraction or ion exchange (para 0029).

Regarding claims 16 and 20, Arroyo teaches that the sodium content in sea water can be used to assist in precipitating iron (para 0019 and 0024).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

S. Agatzini-Leonardou and I.G. Zafiratosm, Beneficiation of a Greek serpentinic nickeliferous ore Part II. Sulphuric acid heap and agitation leaching. *Hydrometallurgy* 74 (2004) p. 267-275.

K. Irons, Heaps of Nickel, *Materials World,* February 2006, p. 28-30.

M.G. King, Nickel laterite technology - Finally a new dawn? *Journal of Metals*, July 2005, p. 35-39

B. Wedderburn, Heap leaching of nickel laterities, Malachite Process Consulting, August 2005, p. 1-32.

-- Claims 1-17 and 19-20 (All pending) are rejected
-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made

to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588. The examiner can normally be reached on Monday - Thursday, 8:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark L. Shevin/

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

10-564,358
May 28th, 2008